TOSHIBA PHOTOCOUPLER PHOTO RELAY

TLP3203

Measuring Instruments Logic IC Testers / Memory Testers **Board Testers / Scanners Power Supply**

The TOSHIBA TLP3203 is an ultra-small photorelay suitable for surface-mount assembly. The TLP3203 consists of a GaAs infrared-emitting diode optically coupled to a photo-MOSFET and is housed in a 4-pin package.

The TLP3203 features low CR multiplication and extremely low On-state resistance, allowing high On-state current.

Its features also include low Off-state current and low output pin capacitance, enabling it to be used for high-frequency measuring instrument applications.

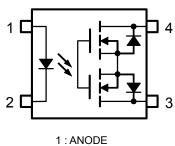
Features

- 4-pin SSOP (SSOP4): 1.8-mm high, 1.27-mm pitch
- 1-Form-A
- Peak Off-State Voltage: 20 V (min)
- Trigger LED Current: 3 mA (max)
- On-State Current: 0.9 A (max)
- On-State Resistance: 0.22Ω (max), 0.18Ω (typ.)
- Output Capacitance: 40 pF (typ.)
- Isolation Voltage: 1500 Vrms (min)

Unit: mm JEDEC **JEITA** TOSHIBA 11-2B1

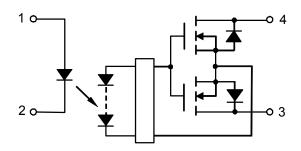
Weight: 0.03 g (typ.)

Pin Configuration (Top View)



- 2: CATHODE
- 3: DRAIN
- 4: DRAIN

Schematic



Absolute Maximum Ratings (Ta = 25°C)

	CHARACTERISTIC	SYMBOL	RATING	UNIT
	Forward Current	lF	50	mA
ED	Forward Current Derating (Ta ≥ 25°C)	ΔI _F /°C	-0.5	mA/°C
"	Reverse Voltage	V_{R}	5	V
	Junction Temperature	Tj	125	°C
~	Off-State Output Terminal Voltage	V _{OFF}	20	V
DETECTOR	On-State Current	I _{ON}	900	mA
ETE	On-State Current Derating (Ta ≥ 50°C)	Δl _{ON} /°C	-12.0	mA/°C
	Junction Temperature	Tj	125	°C
Storage Temperature Range		T _{stg}	-40 to 125	°C
Oper	ating Temperature Range	T _{opr}	-20 to 85	°C
Lead	Soldering Temperature (10 s)	T _{sol}	260	°C
Isolat	ion Voltage (AC, 1 minute, R.H. \leq 60%) (Note 1)	BV_S	1500	Vrms

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

Note 1: Device considered a two-terminal device: Pins 1 and, 2 shorted together, and pins 3 and 4 shorted together.

Caution

This device is sensitive to electrostatic discharge. When using this device, please ensure that all tools and equipment are earthed.

Recommended Operating Conditions

CHARACTERISTIC	SYMBOL	MIN	TYP.	MAX	UNIT
Forward Current	lF	_	_	20	mA
Operating Temperature	T _{opr}	-20	_	65	°C

Note: Recommended operating conditions are given as a design guideline to obtain expected performance of the device. Additionally, each item is an independent guideline respectively. In developing designs using this product, please confirm specified characteristics shown in this document.

Individual Electrical Characteristics (Ta = 25°C)

	CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN	TYP.	MAX	UNIT
	Forward Voltage	V _F	I _F = 10 mA	1.00	1.15	1.30	V
LED	Reverse Current	I _R	V _R = 5 V	_	_	10	μΑ
	Capacitance	C _T	V = 0, f = 1 MHz		15		pF
DETECTOR	Off-State Current	l _{OFF}	V _{OFF} = 20 V	l	l	1	nA
	Capacitance	C _{OFF}	V = 0, f = 100 MHz, t < 1 s	_	40	_	pF

Coupled Electrical Characteristics (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN	TYP.	MAX	UNIT
Trigger LED Current	I _{FT}	I _{ON} = 100 mA	_	_	3	mA
Return LED Current	I _{FC}	I _{OFF} = 10 μA	0.1	_	_	mA
On-State Resistance	R _{ON}	$I_{ON} = 900 \text{ mA}, I_F = 5 \text{ mA}, t < 1 \text{ s}$	_	0.18	0.22	Ω

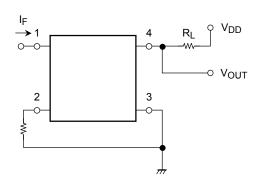
Isolation Characteristics (Ta = 25°C)

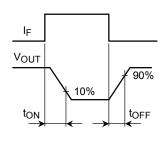
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN	TYP.	MAX	UNIT
Capacitance Input to Output	CS	V _S = 0 V, f = 1 MHz	_	0.3	_	pF
Isolation Resistance	R _S	V _S = 500 V, R.H. ≤ 60%	5 × 10 ¹⁰	10 ¹⁴	_	Ω
	BVS	AC, 1 minute	1500	_	_	Vrms
Isolation Voltage		AC, 1 second (in oil)	_	3000	_	VIIIIS
		DC, 1 minute (in oil)	_	3000	_	Vdc

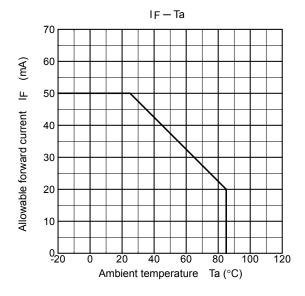
Switching Characteristics (Ta = 25°C)

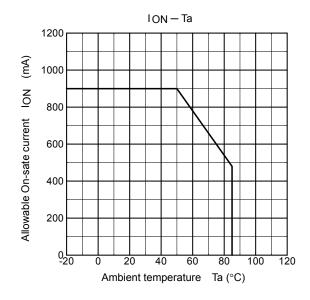
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN	TYP.	MAX	UNIT
Turn-ON Time	t _{ON}	$R_L = 200 \Omega$ (Note)	_	0.3	2	ms
Turn-OFF Time	t _{OFF}	$V_{DD} = 10 \text{ V}, I_F = 5 \text{ mA}$	_	0.2	1	1115

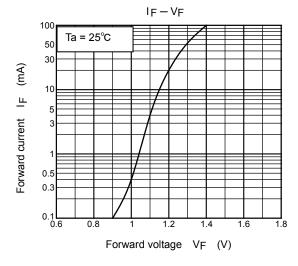
Note: Switching time test circuit

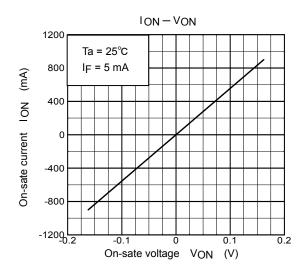


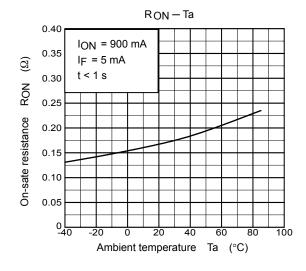


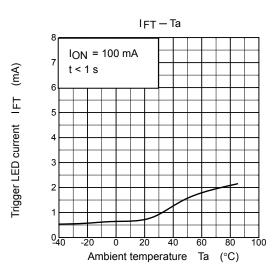




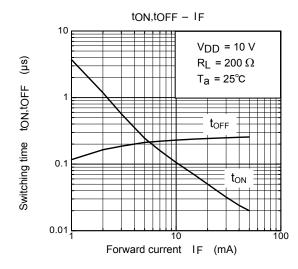


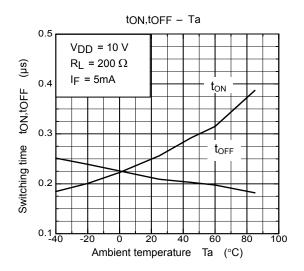


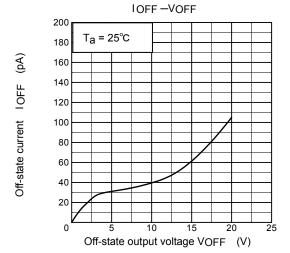


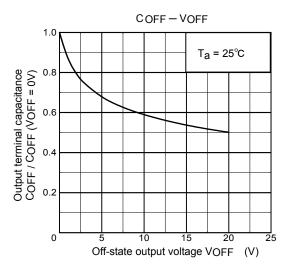


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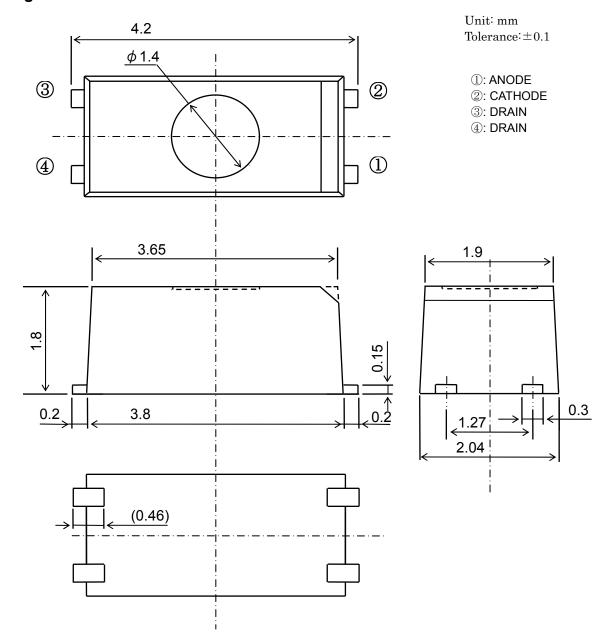








Package Dimensions



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